Stat and Data Analysis Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10.2 One Sample *t*-interval and *t­*-test

1. *Consumer Reports* tested a SRS of 14 brands of vanilla yogurt and found the following numbers of calories per serving:

160 200 220 230 120 180 140

1. 170 190 80 120 100 170

A diet guide claims that you will get 120 calories from a serving of vanilla yogurt. What does this evidence indicate? Does the sample you have indicate that the diet guide is incorrect?

1. Check the conditions (assume the population is normal)
2. Find the mean and std. deviation
3. Test the claim with a level of significance of 1%.
4. Create a 95% confidence interval for the average calorie content of vanilla yogurt.

2. How much time do school-age children spend helping with housework? A random sample of 26 girls in two-parent families where both parents work full-time found a mean of 14.0 minutes per weekday with a standard deviation of 8.6 minutes. A histogram of the data showed a unimodal and approximately symmetric distribution. Construct and interpret a 98% confidence interval for the mean number of minutes spent doing housework.

3. A study of the ability of individuals to walk in a straight line report eh following data on cadence (strides per second) for a sample of 20 randomly selected health men.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0.95 | 0.85 | 0.92 | 0.95 | 0.93 | 0.86 | 1.00 | 0.92 | 0.85 | 0.81 |
| 0.78 | 0.93 | 0.93 | 1.05 | 0.93 | 1.06 | 1.06 | 0.96 | 0.81 | 0.96 |

1. Construct a histogram. Does the data appear to come from a distribution that is unimodal and symmetric?
2. Construct and interpret a 96% confidence interval for the mean cadence.

4. A study conducted by researchers at Pennsylvania State University investigated whether time perception, a simple indication of a person's ability to concentrate, is impaired during nicotine withdrawal. After a 24-hr smoking abstinence, 20 smokers were asked to estimate how much time had passed during a 45-sec period. These smokers were not a random sample but were considered a representative sample. The mean perceived elapsed time was 59.30 seconds with a standard deviation of 9.84 seconds. Is there evidence that smoking abstinence had a negative impact on time perception, causing elapsed time to be overestimated? Use a significance level of 1%.

5. Suppose that the CEO of a large corporation wants to determine whether the average amount of time spent on personal use of company technology for her employees is greater than the reported value of 75 minutes per day. Each person in a random sample of 40 employees was contracted and asked about daily personal use of company technology. The mean time reported was 74.80 minutes with a standard deviation of 9.45 minutes. Do these data provide evidence that the mean for this company is greater than 75 minutes? Use a significance level of 5%.